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Neal et al.

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(54) **METHOD AND APPARATUS FOR FORMING A HELICAL TUBE BUNDLE**

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CPC **B21D 11/06** (2013.01); **B21D 7/08** (2013.01); **B21D 39/04** (2013.01); **B21D 53/027** (2013.01); **B21D 53/06** (2013.01); **B23P 15/26** (2013.01)

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(57) **ABSTRACT**

Apparatus and method for forming a plurality of elongate members into a helical bundle. The apparatus has a plurality of bending die heads that are mounted in a circular array within a rigid housing. The bending die heads each have a pair of grooved rollers that engage the sides of the tubes to apply a bending force while allowing the tubes to move longitudinally through the bending die stock. The bending die heads can be rotated about their longitudinal axes to impart a helical twist to the tubes as they pass through the bending die stock. The apparatus also has a collet stock assembly, which consists of a collet that has a plurality of apertures equal to the number of tubes in the bundle to be formed. The collet stock is mounted to a housing that is secured to a carriage. The carriage is driven by motor and lead screw to move linearly along a track toward and away from the bending die stock while the collet is rotated at a predetermined speed to form a helical bundle.

6 Claims, 9 Drawing Sheets

